



**MOTOROLA**

*Globally Harmonized spectrum for  
for PPDR and the role of ITU in  
global spectrum harmonization*

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# Agenda

- **Key requirements for timely response to disasters**
  - Effective communications
  - Interoperability
  - Globally/ Regionally harmonised bands
- **Spectrum**
  - Spectrum for PPDR in the Asia Pacific (Asia)
  - Value of PPDR spectrum below 1 GHz
  - Digital Dividend and PPDR in Asia
- **Emerging Technologies for PPDR**
  - 4G, TVWS

# Terminology/Acronym

**PPDR : Public Protection and Disaster Relief – public safety/security, fire service, civil defence.**

**PMR : Private/Professional Mobile Radio – Radio systems operated on a closed user group basis; government agencies, ports, airports, private companies**

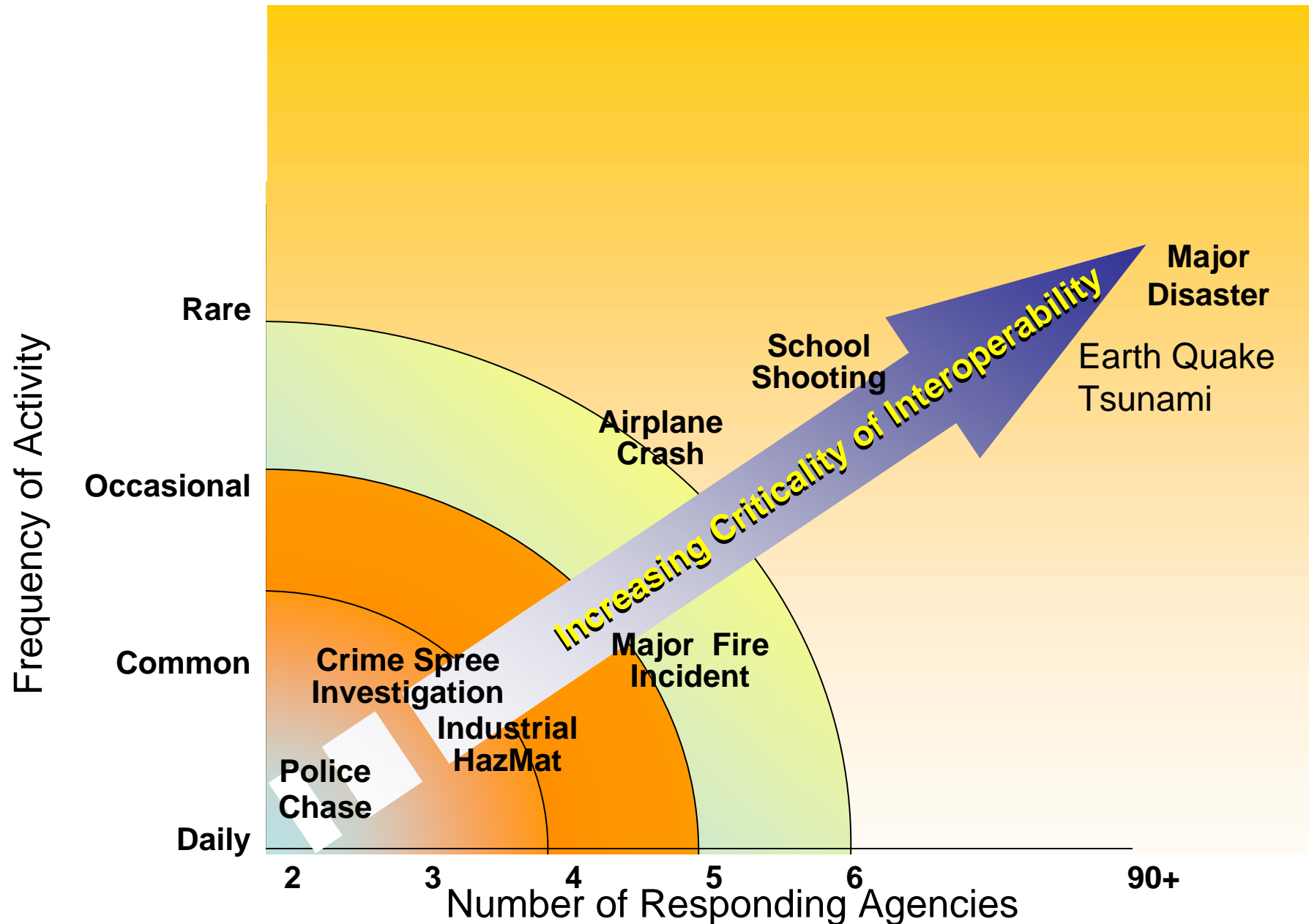
**Harmonised band : a frequency band used by the same radio technology in multiple countries: e.g. GSM mobile cellular**

**Trunk(ed) radio : PMR network that employs trunking technology.**

**TVWS : Television White Space**



**“After Each Major Event in Recent History, the Most Glaring Indication of Success or Failure by Responding Agencies Has Been Their Ability to Effectively Communicate With Each Other.”**



**Large Disaster events involve very large number of responding agencies and Relief Teams**

## Communications are essential to respond to Emergencies



**“Urgently identify specific actions to improve emergency communications and Interoperability”**

**National Security Telecommunications Advisory Committee (NSTAC)  
letter to US President after 9-11**

**interoperable and effective communications are essential for timely disaster response**

**Training**

**SOPS**

**Interoperability**

**Globally /Regionally  
Harmonized  
frequency bands**

**Global /Regional  
Equipment standards  
for interoperability**

# Wireless Technologies are key to manage Public safety and respond to Disasters



# Technology Needs of Professional Users

## **Guaranteed service**

- under normal conditions and during incidents & disasters
- Planned capacity for emergency handling
- Semi-duplex (only one channel per group per site)

## **Fast group communications**

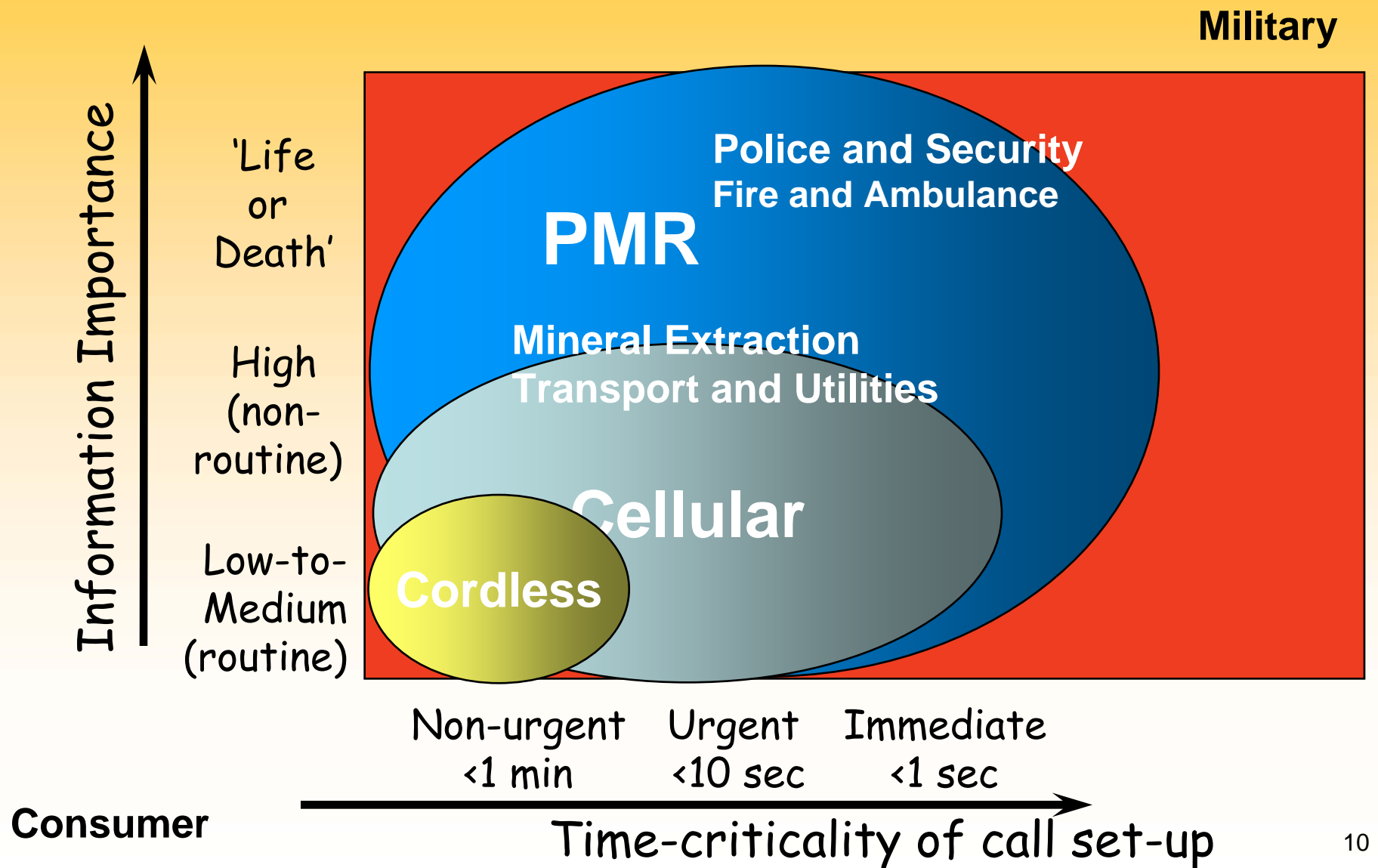
- Fast set-up time
- Good dispatching facilities
- Dynamic group management

## **Specific functionality**

- Emergency calls (pre-emptive)
- Security
- Monitoring,
- Status messages



# Wireless Technologies



# Role of Commercial Cellular and PMR Technologies in PPDR

## Commercial Cellular

- **Communications for large public masses in populated areas but limited role for guaranteed services for PPDR agencies**
- **Limited capabilities for group call set-up and dispatch functionality even with POC (PTT Over Cellular)**

## PMR Technologies (APCO,TETRA)

- **Guaranteed service during emergencies and disasters**
- **powerful dispatch and group communications functionality**
- **special terminals for PPDR agencies**
- **Supports large talk groups**



### Terminals



MTP850



ATEX



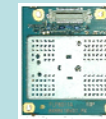
MTM800e



DMO Gateway/  
Repeater



TETRA  
PDA



TETRA  
Modem



TETRA  
Covert

### Accessories



# Spectrum is Key to Saving Lives

- Radio Frequency Spectrum is the Essential Foundation Needed to Help Distribute critical disaster and public safety information
- Globally and Regionally Harmonized Frequencies are key to providing interoperable and effective communications
- With harmonized frequencies and common standards, cost of equipment will be substantially reduced
- Economies of scale can therefore increase response capabilities and coverage

## **ITU's WRC 2003 approved Resolution 646**

- **Identified Regional frequency bands for PPDR. The bands included in this resolution for Asia Pacific (ITU-R Region 3) are:**
  - 406.1-430 MHz, 440-470 MHz,
  - 806-824/851-869 MHz,
  - 4900-4990 MHz, 5850-5925 MHz and
  - 380-400 MHz, 746-806 MHz are included in a foot note in the resolution
- **Encouraged administrations to consider global and/or regional frequency bands / ranges for emergency and disaster relief when undertaking their national planning**

**Harmonized frequency bands are key to providing interoperable and effective communications**

# Key Broadband Spectrum Needed

## Available Today

- VHF/UHF Public Safety Bands (146-174 MHz, 300-500MHz and 806-869 MHz) for voice and narrowband to wideband data for wide area coverage
- Unlicensed wideband data in 2.4 and 5 GHz bands
- 4.9 GHz Public Safety Band for broadband  
Localized, hot-spot/ on-scene coverage

## Emerging Opportunities: Beginning 2009

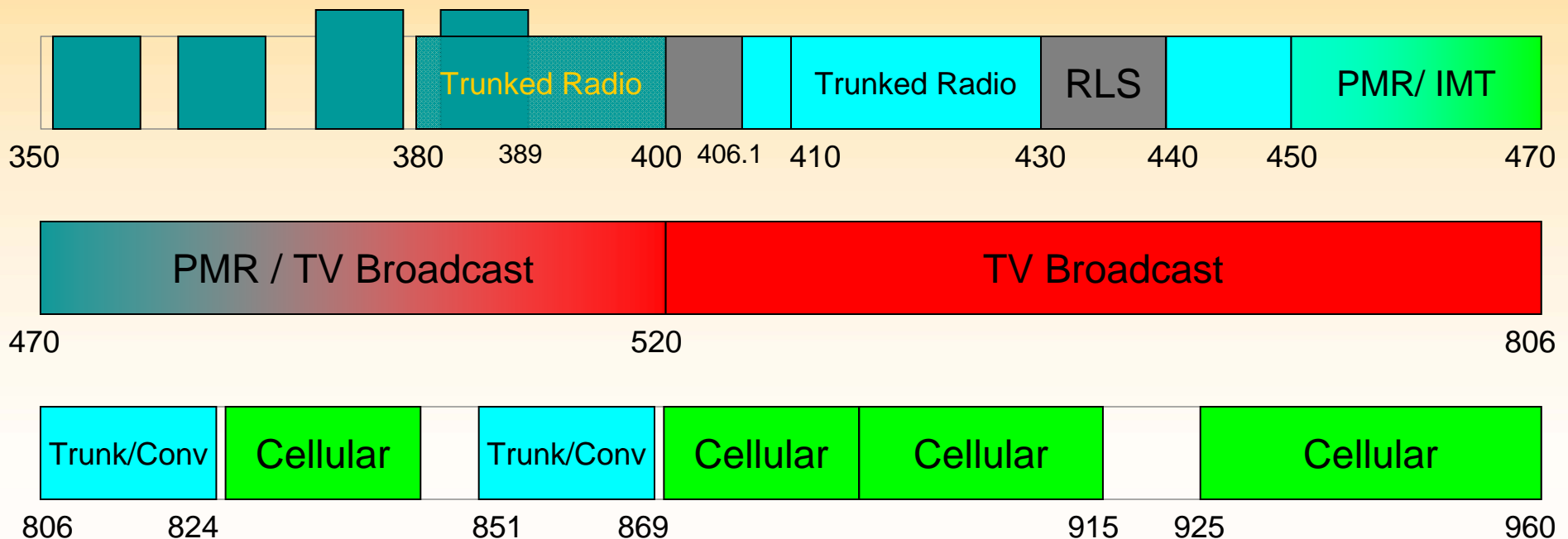
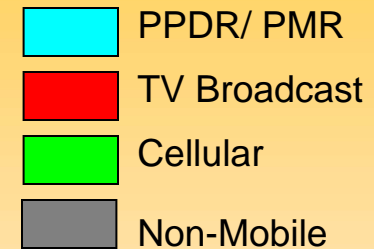
- 700 MHz Public Safety Broadband for wide area coverage
- TV White Space (Proposed, unlicensed, supplemental)

**Broadband spectrum provides the capacity to communicate more information in real-time, e.g., video**

# PPDR Spectrum Below 1 GHz Today

Virtually ALL narrowband PMR radio products operate at below 1 GHz

- 406.1-430 MHz, 440-470 MHz
- 806-824/851-869 MHz
- 4900-4990 MHz, 5850-5925 MHz and
- 380-400\* MHz, 746-806\* MHz
  - \*These bands are included in a foot note in the resolution



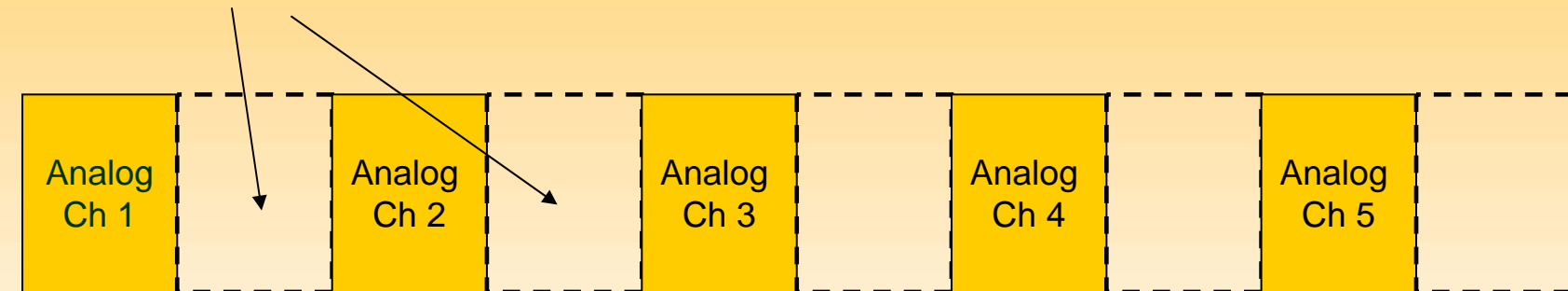
**PPDR Spectrum below 1GHz is very valuable**

# Digital Dividend and PPDR Spectrum Opportunity

## What is Digital Dividend?

The release of **Spectrum** after the migration from analogue TV to digital TV.

Analogue TV do not allow adjacent channel use in the same area.

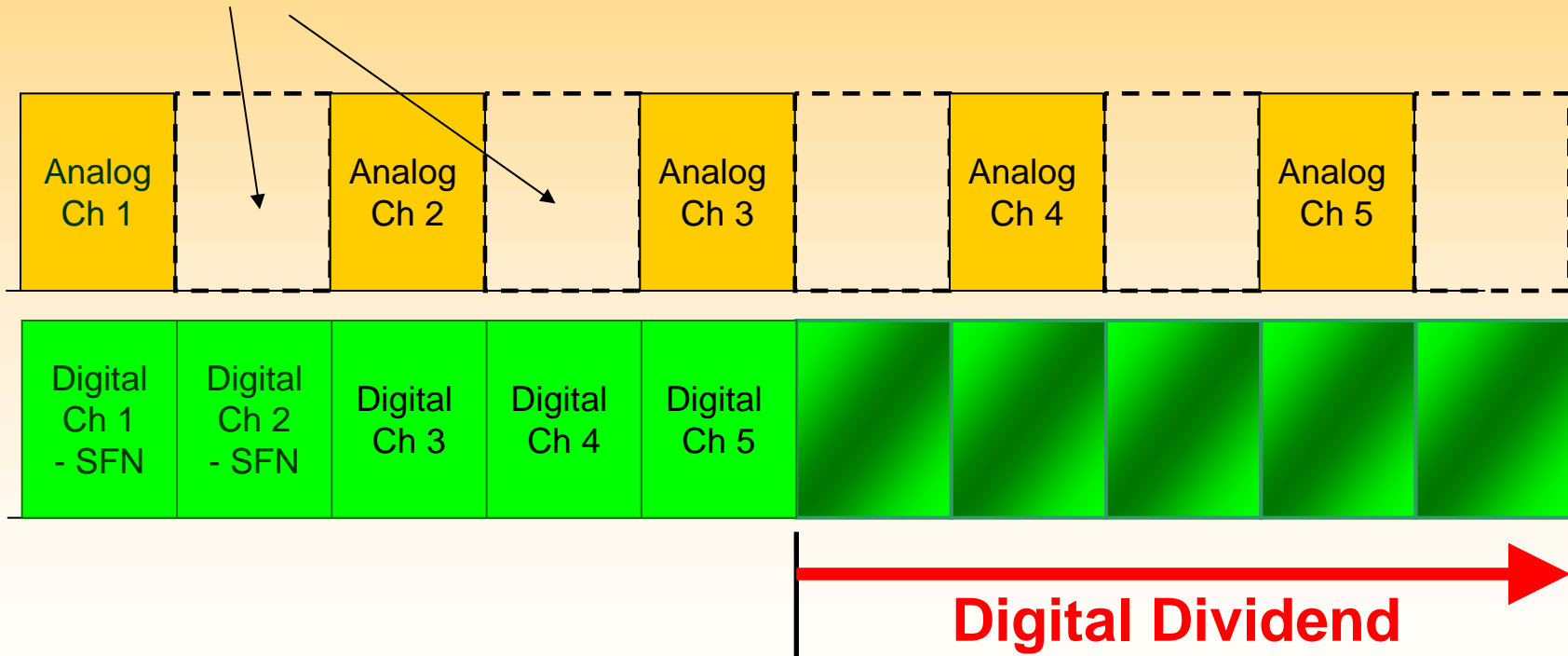


# Digital Dividend and PPDR Spectrum Opportunity

## What is Digital Dividend?

Spectrum for the MOBILE service from the transition from analogue to digital television

Analogue TV do not allow adjacent channel use in the same area.



**Prioritise Digital Dividend spectrum for PPDR**

# Digital Dividend Overview – U.S.A.

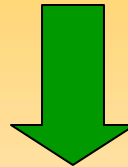
- First to take advantage of Digital Dividend

10-12 Year process from start to get spectrum in hands of users

**TV: 408 MHz of Spectrum (VHF & UHF)**

TV CHS VHF 2-13 and UHF 14-51

TV CHS 52-69



698 MHz

806 MHz

TV Clears by  
Feb. 17, 2009

**TV: 300 MHz**

**108 MHz**



700 MHz Band  
Allocation Done  
Public Safety: 24 MHz  
Commercial: 84 MHz

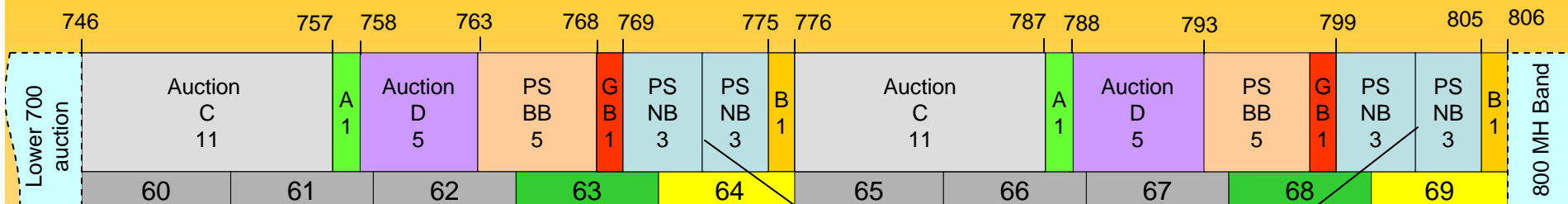
**TV: 300 MHz**

**108 MHz**

 **TV Whitespace (Proposed) : Spectrum Amount & Location Varies By Geography**

Each TV CH = 6 MHz

# U.S. 700 MHz PPDR Narrowband: 12 MHz of 24 MHz



**Note: Slide shows portion of 700 MHz band.  
Additional 48 MHz from 698 to 746 MHz not shown**

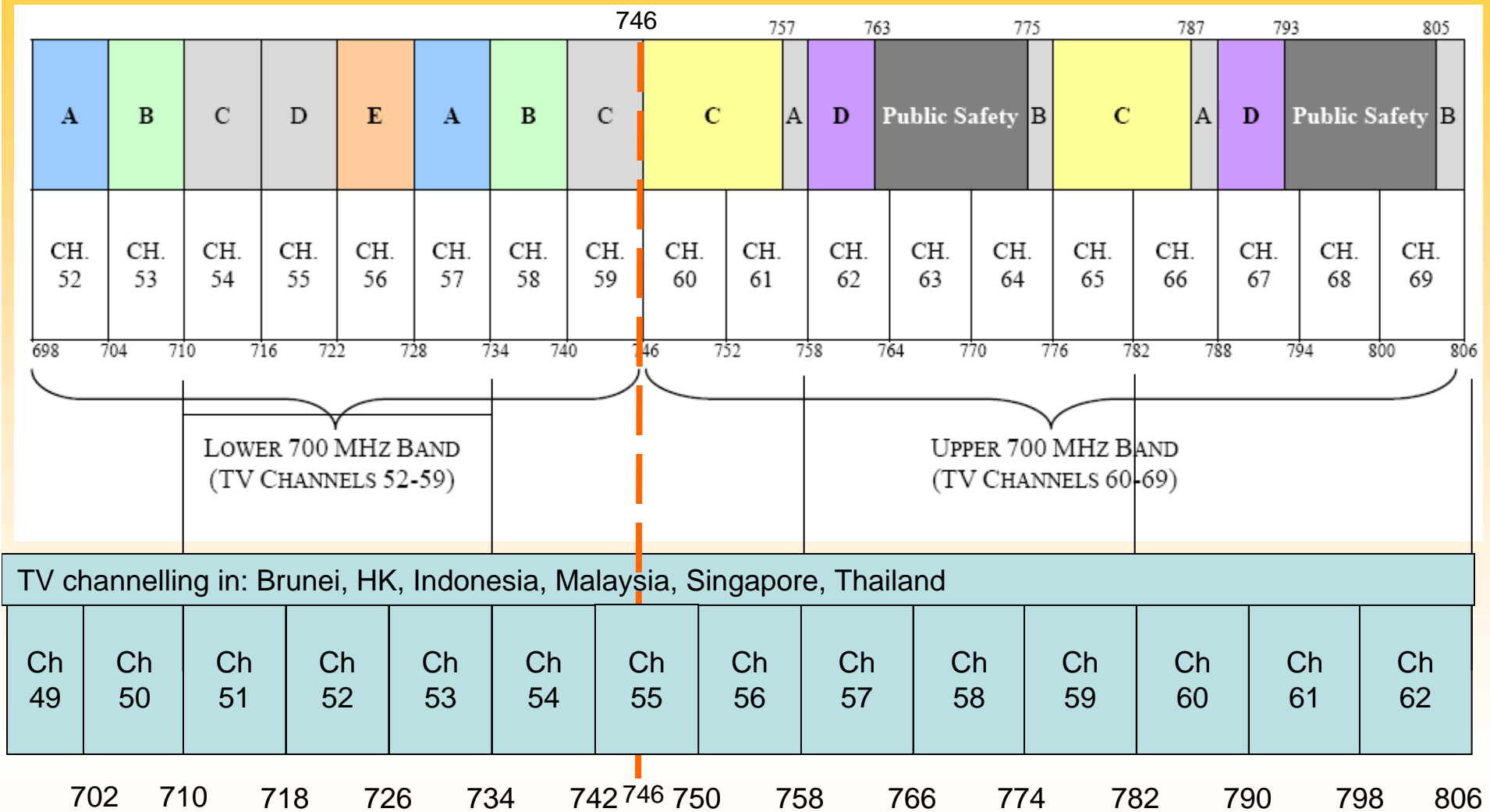
PPDR Narrow Band

**6+6 MHz**

**Narrowband: 769 – 775 MHz paired with 799 – 805 MHz**

- Licensed to Individual Public Safety agencies
- 12.5 kHz efficiency now; 6.25 kHz equivalent efficiency set for 2015/2017
- P25 Phase I required in equipment and for operation on interop channels
  - 12.5 kHz channels with 2 slot TDMA meets the future efficiency
- 700/800 MHz dual band P25 mobiles/portables & 700 bases readily available
- Over 40 systems deployed in U.S. as of April 2008 where there is no TV conflict; Almost all operate with 12.5 kHz P25
- More systems expected to be deployed once TV clears in Feb. 2009

# Digital Dividend for PPDR in Asia

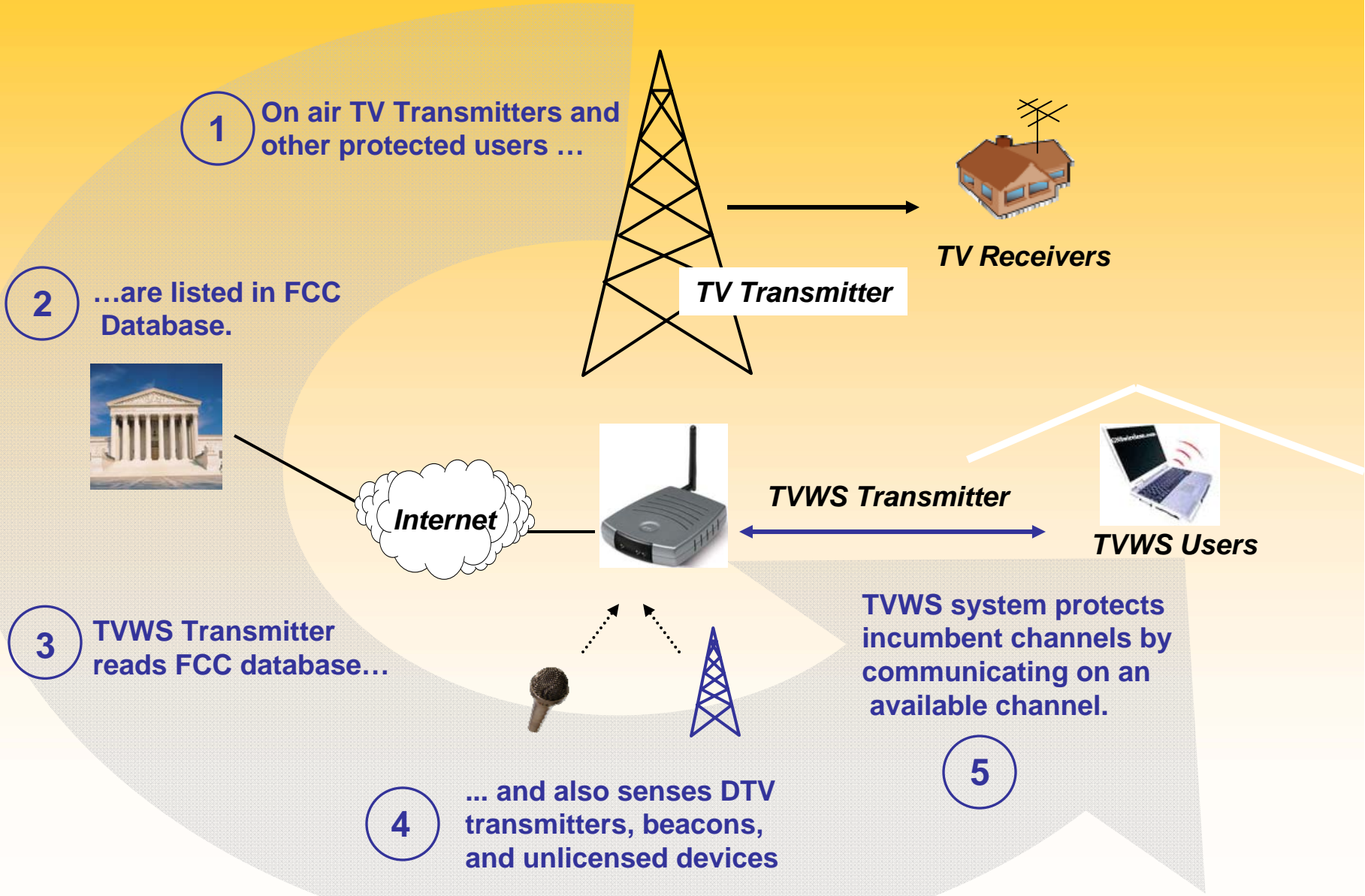


**Recommendation: Top priority for PPDR in 746 – 806 MHz**

# Emerging Technologies in 700 MHz

- **Several technologies vying for the nation-wide deployment in the US.**
  - WiMAX
  - 3GPP pushing LTE
  - TV whitespace (TVWS) device:
    - low power devices in the television (TV) broadcast spectrum at locations where channels are not being used for authorized services. This unused spectrum is often referred to as the “TV white spaces.”
    - FCC Office of Engineering & Technology (OET) completed initial (Phase 1) tests in July of 2007
      - Phase 2 bench testing of WSD began on 24<sup>th</sup> Jan 2008
    - 4<sup>th</sup> Nov, 2008 – FCC adopts rules for unlicensed use of Television White Spaces.

# Simple TV White Space (TVWS) Operation



# Summary

- **Key Requirements for timely response to disasters**
  - Radio-communications is essential to managing public safety and responding to disasters
  - Effective communications
  - Interoperability among responding agencies is critical to timely emergency response
- **Spectrum**
  - ITU-R harmonized frequency bands are key to providing interoperable and effective PPDR communications
  - PPDR spectrum below 1 GHz is very valuable
  - Digital Dividend is key to PPDR broadband
- **Spectrum, Technologies, and applications together will serve as a Force Multiplier for public safety and disaster relief applications**
- **New technologies for PPDR are emerging in 700 MHz band**
  - LTE, TV White Space

Thank You

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# U.S. 700 MHz PS BB- Public/Private Partnership

